

Appln No. 09/529,483

Reply to Office action of December 18, 2003

REMARKS/ARGUMENTS

Reconsideration and reexamination of the above-identified patent application is hereby requested.

Claims 1 - 43 are now in the application.

The Examiner has rejected Claims 1 - 43 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1 - 71 of U.S. Patent No. 6,280,385. The Examiner states that such obviousness-type double patenting rejection of Claims 1 - 43 could be overcome if a timely Terminal Disclaimer is filed.

The Applicants submit herewith a Terminal Disclaimer to overcome the obviousness-type double patenting rejection.

The Examiner has rejected Claims 1 - 43 under 35 U.S.C. §103 as being unpatentable over Fabian.

The Applicants independent Claim 1 calls for (underlining added for emphasis) ... An MR imaging method for imaging and determining position of a medical device ... the method comprising: ... applying high-frequency radiation having a specific resonance frequency essentially equal to a resonance frequency of the passive resonance circuit so that transitions between spin energy levels of the atomic nuclei of the examination object are excited, and MR signals are produced, ... unfolding the unfolding portion of the device after insertion into the examination object such that the inductor formed by or integrated into the unfolding portion unfolds along with the unfolding portion, ...

The Applicants independent Claim 9 calls for (underlining added for emphasis) ... A medical device that at least in part

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is capable of being unfolded comprising: ... wherein the at least one passive resonant circuit shifts excitation of spin energy levels of atomic nuclei of an examination object to generate an enhanced MR signal in a locally defined area, and wherein a part of the device that is capable of being unfolded forms the inductor or the inductor is integrated into such a part, such that the inductor unfolds along with the device when the device is unfolded.

The Applicants independent Claim 31 calls for (underlining added for emphasis) ... An MR imaging system for imaging an examination object having a medical device inserted therein, ... the inductor being integrated into or formed by an unfolding portion of the medical device that at least in part is capable of being unfolded when inserted in the examination object, the imaging system comprising: ... wherein the medical device modifies the transitions between spin energy levels of the atomic nuclei of the examination object to change the signal response of the examination object in a locally defined area ...

The Applicants independent Claim 32 calls for (underlining added for emphasis) ... An MR imaging system comprising: ... a medical device that at least in part is capable of being unfolded, the medical device comprising, ... wherein the at least one passive resonant circuit shifts excitation of spin energy levels of atomic nuclei of an examination object to generate an enhanced MR signal in a locally defined area, and ... wherein a part of the device that is capable of being unfolded forms the inductor or the inductor is integrated into such a part, such that the inductor unfolds along with the device when the device is unfolded.

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The Applicants independent Claim 39 calls for (underlining added for emphasis) ... An MR imaging method for imaging and determining position of a medical device. ... the method comprising: ... applying high-frequency radiation to an examination object after the medical device is unfolded therein such that the inductor integrated into the unfolding portion unfolds along with the unfolding portion, the high frequency radiation having a specific resonance frequency approximately equal to a resonance frequency of the passive resonance circuit to excite transitions between spin energy levels of the atomic nuclei of the examination object, and produce MR signals, ... wherein the excited resonance circuit amplifies the excitation of transitions between spin energy levels of the atomic nuclei of the examination object in a locally defined area to produce amplified MR signals; and ...

The Applicants independent Claim 42 calls for (underlining added for emphasis) ... A medical device for use in an MR imaging system, the medical device comprising, ... the inductor being integrated into an unfolding portion of the medical device, such that the inductor unfolds with the unfolding portion of the medical device after insertion in an examination object, ...

Accordingly, the Applicants submit that the invention as claimed in independent Claims 1, 9, 31, 32, 39 and 42 are neither taught, described or suggested in Fabian, even in view of the use of MR Imaging.

The Applicants submit that the detection of the Fabian marker is based on fundamentally different technologies than that of the present invention, such that MR Imaging can not be regarded as an alternate functional equivalent to inducing a

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magnetic field into an LC circuit of an attached marker to enable locating a medical device.

The Examiner indicates with reference to Fabian column 3, lines 66 to 68, and column 4, lines 1 to 34, that Fabian teaches all the features of the current invention.

In contrast to the present invention, however, the Applicants submit that the Fabian sponge medical device with a LC-marker thereon does not comprise an inductor that is integrated into or formed by an unfolding portion of the medical device. Instead, Fabian teaches a marker 18 which is secured to a surgical implement, such as a sponge, positioned within a wound. While some household sponges might merely expand in size when in contact with a liquid, a surgical sponge, which is typically a small pad made of multiple folds of gauze and cotton used to mop blood from a surgical incision, cannot be perceived as an unfolding portion of a medical device. The Fabian marker 18 is simply attached to the sponge and does not unfold itself after the medical device is inserted into the examination object.

In addition, a person skilled in the art would not have arrived at the invention of the present application by combining the teachings of Fabian with general knowledge about magnetic resonance technology known at the time of the invention. In fact, the Applicants submit that the teachings of Fabian can not be used together with magnetic resonance technology.

For example, according to Fabian's claim 1, the marker that is secured to a surgical implement is adapted to undergo resonance at only a preselected frequency, causing a substantial change in its effective impedance. In contrast, the present invention using magnetic resonance technology does not depend on

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a preselected frequency, but depends on the relaxivity of hydrogen protons in close proximity to the resonator and the influence of the resonator on the exitation angle. According to the present invention it is not the resonator that is being detected in a magnetic field, but it is the magnetic resonance response of the protons that is altered and can be detected.

Furthermore, according to Fabian column 4, lines 39 to 42, a "hard ferromagnetic element 36 ... is adapted, upon being magnetized, to arm the strip 34 to resonate at the preselected frequency." Also, according to Fabian column 4, lines 60 to 62, this hard ferromagnetic element 36 can be made of metal alloy such as ArnoChrome.

As is known to those skilled in the art, the Applicants submit that FDA regulations do not permit the use a ferromagnetic component together with a magnetic resonance system and that Arnochrome is not compatible with magnetic resonance technology.

In addition, Fabian teaches the use of a marker 55 that is comprised of a piezoelectric crystal 56 (see column 5, lines 7 to 22). However, the Applicants submit that it is technically not possible to use such a piezoelectric crystal in a strong static magnetic field as is required in magnetic resonance technology.

Accordingly, the Applicants submit that one skilled in the art would not consider combining the teachings of the Fabian attached LC-marker undergoing resonance at a preselected frequency with that of magnetic resonance technology to locate the position of a medical device.

Therefore, the Applicants submit that Claims 1, 9, 31, 32, 39 and 42 are not unpatentable over Fabian.

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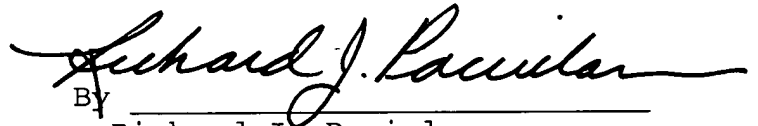
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Claims 2 - 8, 33 and 35 are dependent on Claim 1. As such, these claims are believed allowable based upon respective Claims 1, 9, 31, 32, 39 and 42.

Accordingly, in view of the above amendment and remarks it is submitted that the claims are patentably distinct over the prior art and that all the rejections to the claims have been overcome. Reconsideration and reexamination of the above Application is requested.

Respectfully submitted,

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